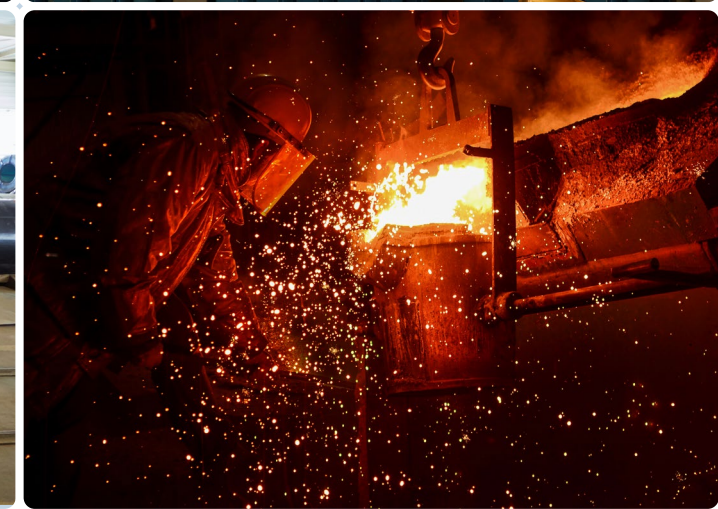
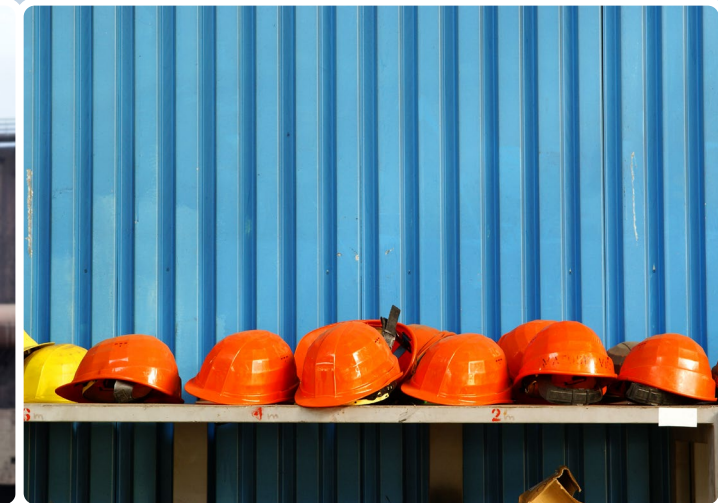


# Process Safety Management





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## 1 Introduction

Process Safety Management or PSM has been known about for several decades, particularly as a result of several historical devastating industrial disasters, within the Oil & Gas industry. The key questions I would like to explain to our members and other interested groups are;

- Why is PSM important to all of us in the stainless steels industry?
- What are the ISSF doing to support our members in PSM?
- What can we do to protect ourselves from Process Safety Incidents?

## 2 Why is Process Safety Management Important?

1. Process safety incidents are the highest single cause of fatalities in our industry
2. Process safety incidents can lead to multiple fatalities, many serious injuries, massive pollution, major economic disruption, significant corporate fines, personal and corporate prosecution and imprisonment
3. Process safety incidents are less easy to predict when compared to occupational safety incidents and will frequently necessitate complex countermeasures

## 3 What is Process Safety Management?

- PSM is a complimentary blend of engineering, operations and management skills
- It is focused on preventing catastrophic accidents, particularly structural collapse, explosions, fires and toxic releases all associated with loss of containment of energy or dangerous substances (eg; toxic gases, molten metal, chemicals and petroleum products)
- The manufacturing of all steels involves processes with intrinsic hazards that need careful management, particularly by bringing together the complimentary skills described above with PSM specialists.
- This means the measures needed to control these hazards are often complex
- The primary focus of PSM needs to be avoiding loss of containment
- Some well-known and devastating industrial examples of PSM failure include
  - Flixborough, UK, 1974, 28 fatalities, 0.5bn USD in losses
  - Piper Alpha, UK, 1988, 167 fatalities, 9.3bn USD in losses
  - Texas City, USA, 2004, 15 fatalities, 1.1bn USD in losses
  - Deepwater Horizon, 2010, 11 fatalities, 44.8bn USD in losses
- Not undertaking PSM will result in an unwanted domino effect when things go wrong. These unwanted outcomes will include;
  - The killing and injuring of many people
  - The creation of massive pollution
  - Delivery of major economic disruption
  - Severe damage to a company's reputation
  - Delivery major negative financial impacts
  - Paralysis of a company's activities
  - Paralysis of an entire organisations
  - Removal and prosecution of company leaders or the company itself
  - Individuals within a company being imprisoned

## 4 What can we do to protect ourselves from Process Safety Incidents (PSIs)?

The ISSF supports PSM in conjunction with worldsteel through the following approaches;

- HSE committee, task force and knowledge sharing
- PSM expert groups (run by worldsteel)
- PSM workshops (run by worldsteel)
- The Steel Safety Day every April
- PSM webinars
- PSM awards for outstanding development of PSM processes
- Best practice sharing amongst members

### Protecting Ourselves from Process Safety Incidents (PSIs)

It is important that all organisations establish some clear fundamentals which should include (as a minimum);

1. Ensuring there is a commitment to Process Safety Management
2. Establishing a hazard evaluation and risk analysis programme
3. Implementing and maintaining a risk management and control system
4. Striving towards excellence in learning from experience
5. Utilising continuous improvement approaches to ensure Process Safety Management system effectiveness
6. Maintaining a sense of vulnerability in Process Safety Management

We will now expand a little further on these 6 key fundamentals.

#### 1. Ensuring there is a commitment to PSM

Organisations must develop and maintain a process safety culture and also ensure good workforce involvement and participation. They should also ensure a strong wider stakeholder involvement.

It is equally important to develop workforce competencies in PSM, particularly thinking about the domino effect when several unwanted features come together. The development of robust standards is vital to deliver safe performance based on adherence to those standards.

**Key question; Is Process Safety Management a core value in your organization?**

#### 2. Establishing a Hazard Evaluation and Risk Assessment Programme

It is important to ensure your workforce has solid process and equipment knowledge, which must include an understanding of legal process and material on-site storage issues.

It is equally important to establish a hazard identification and risk analysis (HIRA) process which will equally ensure consideration of the domino effect.

Key elements of thinking should include, what hazards could come together to create a devastating outcome? Do we have barriers in place to prevent these situations from happening?

**Key question; Do you understand your PSM hazards and risks?**

### 3. Implementing and Maintaining a Risk Management and Control System

It is vital to establish good operational practices coupled with good asset integrity and reliability. Equally, contractors must be part of the whole PSM programme. Investing in training will always pay dividends; however, ongoing performance monitoring can never be overlooked otherwise learnings will be forgotten. The application of robust management of change processes can equally not be overlooked otherwise undesirable outcomes will be seen on a regular basis. It is important to be prepared for, and practice, emergency procedures. Most emergency services will welcome this proactive approach.

**Key Question 1; Do you manage your PSM risks to keep them at tolerable levels?**

**Key Question 2; Do you have robust emergency plans in all your units?**

### 4. Striving for Excellence in Learning from Experience

It is crucial that all PSM incidents including near misses are thoroughly investigated. There are many learnings that can be adopted providing the most appropriate analysis tools (eg; *Ishikawa diagrams*, *5 why analysis*, *PDCA tools*) are adopted.

The ongoing monitoring of external sources of information provides a great opportunity to take proactive action.

It is important to measure performance using industry standard metrics otherwise you will end up comparing apples with pigs rather than apples with apples. The ability to adopt best practices and understand your own PSM maturity will be meaningless without a common standard.

**Key Quote; “There is only one thing more painful than learning from experience and that is not learning from experience”**

Archibald MacLeish, American Poet & Writer

### 5. Utilising Continuous Improvement to ensure PMS system effectiveness

It is vital to audit your PSM system regularly which means looking at your ongoing safety performance, including the identification of hazards and the likely consequences arising from those hazards. Furthermore the consideration of impacting hazards and the likely outcomes of those impacts should not be overlooked or dismissed. The devastating examples we all know about are solid reminders of dismissing possible events as highly unlikely.

The undertaking of safety behavioural observations when working in hazardous areas is another best practice approach. There will always be new observed features every time an audit is undertaken which will provide rich information for ongoing process safety management development.

Management engagement is vital and the regular undertaking of management reviews of the audits and PSM system will provide both an opportunity for PSM system development and personal development in the field of PSM. It is important however that members of the management teams do not become blinded by previous successes.

Don't ever forget .... train, train, train in PSM

**Key Quote; “If you think training is expensive, try ignorance”**

Peter Drucker, US Management Consultant & Founder of the Drucker Institute

### 6. Maintaining a Sense of Vulnerability

Never ever believe that 'it can't happen here' .... it can. Therefore, it is vital to fully utilize PSM training to fully consider what could and therefore can happen. These considerations should form part of focused audits of your PSM system where specific linked or adjacent processes are audited. Applying a 5 why analysis when undertaking the audit process will help to drive down to real issues and help to eliminate urban myths or beliefs.

**Remaining vulnerable in this context is healthy. The Titanic was billed as 'unsinkable'!!**



## 5 Summary

Process Safety Management is something that we all must consider deeply and daily as part of our professional lives. Spending time within our operational facilities studiously looking at our hazardous and high risk areas will ultimately deliver benefits for our organisations. We must remember that PSM is a long-term game .... benefits and results do not come instantly .... and we are working to prevent a devastating outcome from occurring. PSM is something that we must repeat constantly within our environments in order to prevent the notion of 'fast forgetting' dominating how we approach industrial safety.

The downsides of not developing and maintaining robust PSM systems are frightening on many levels including our workforce, their families, our society, our organisations, our senior managers and our environment. None of can afford to say 'it can't happen here'.

Within the ISSF and worldsteel, we have a useful library of reference events, training and best practice guidance. We are always happy to help our members and offer guidance, direction and on-site support of needed. Please do not hesitate to contact us.

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## About ISSF

The International Stainless Steel Forum (ISSF) is a not-for-profit research and development organisation which was founded in 1996 and serves as the focal point for the global stainless steel industry.

### Vision

Sustain our future with stainless steels

### Membership of the ISSF

ISSF has two categories of membership namely:

- a. **company members** who are producers of stainless steels (integrated mills and re-rollers)
- b. **affiliated members** who are national or regional stainless steels industry associations.

The ISSF now has 57 members in 26 countries. Collectively they represent approximately 90% of the total production of stainless steels.

### More information

For more information about ISSF, please consult our website [worldstainless.org](http://worldstainless.org).

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